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ABSTRACT

Teleconferencing is a discussion by telephone among individuals and groups of people in two or more locations for the purposes of instruction and conducting meetings. Audio conferencing connects people by voice alone, audiographic conferencing allows people to speak and to exchange text and graphics over the telephone line, and video conferencing allows people to speak and to see each other live on a television screen. The advantage of teleconferencing is that it brings together people who are far apart, quickly and in a cost-effective manner. The disadvantages are that communication from face-to-face contact is lost and sound quality must be very high. An effective teleconference includes good audio equipment, trained personnel, and well-prepared support materials. There are a number of examples of the use of teleconferencing in distance education including the German Post Office, Roche Laboratories, the Conference Call in Turkey, and the British Open University. Future uses of teleconferencing will be developed through the Integrated Services Digital network (ISDN), a newly-developed communication system based on the telephone, computer and modem, and television. This presentation concluded with a brief description of teleconferencing in Turkey and a live example of an audio teleconference connecting the conference room with three other locations, one in the United States and two in Turkey. (17 references) (DB)

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THE INTEGRATION OF TELECONFERENCING IN DISTANCE TEACHING

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INTRODUCTION

Teleconferencing is a discussion by telephone among individuals and groups of people in two or more locations. More complex kinds of teleconferences include the use of one-way or two-way video, electronic blackboards, facsimile, computer graphics, radio, and satellites.

Teleconferences are used primarily for two purposes: first, for instruction in both formal educational settings like universities and in training situations, and second, for conducting meetings. In educational and training settings, the instructor who is at one location provides information by telephone to people who are in either one or several other locations. Meetings, on the other hand, involve discussions among individuals or groups of people who are located in different places.

Educational institutions and businesses alike have learned that teleconferencing is a flexible way to reduce communication costs and improve the quality of service to distant students and trainees. Traditional, or face-to-face instruction, has meant that instructors travel to a number of locations to meet their students, or that students travel to a central location to meet their instructors. Now people do not have to spend extra time and money for travel. Teleconferences provide a cost-effective way to provide seminars and tutorials to distant learners.

KINDS OF TELECONFERENCES

Three kinds of teleconferences are used today to connect individuals and groups of people who are located at a distance from each other. These teleconferences are audio conferences, audiographic conferences, and video conferences.

First, an audio conference connects people by voice with the telephone. A telephone "bridge" then connects people in several places. Thus people can both hear each other and talk with each other even though they may be in widely separated locations. Audio teleconferencing uses regular telephone lines provided by the local telephone company. The new "dial-up" system allows people to telephone the conference bridge at a prearranged time, either from their homes with a normal telephone handset, or from a center with a loudspeaking telephone. The costs of an audio conference equal the total telephone line charges from the "bridge" to each location, plus the loudspeaking equipment costs.

The second kind of teleconference is an audiographic conference. This allows people to speak with each other and to exchange text and graphics over the telephone line. Instructors and students in different locations both speak to each other and write to each other on a computer and on a graphics tablet with a sensitive light pen. The people at other locations see the image on a television screen and write back with their own computers and graphics tablets. Audiographic conferences are especially useful when instruction includes technical information with charts and diagrams. The telephone line costs for audiographic conferences are approximately the same as for audio conferences, if a single telephone line is used, but the equipment costs are higher.

The most sophisticated and most expensive kind of teleconference is a video conference. A two-way video conference allows people to talk with each other and see each other live on the television screen. The less expensive one-way video usually shows only the instructor. When one-way video is combined with two-way audio conferencing, students can telephone the instructor and communicate interactively by voice. Video conferences are useful when instruction includes work with complex equipment, or when the instructor demonstrates something. Costs for full- motion video conferences are high, several times the costs of audio and audiographic conferences, because the transmission requires two telephone lines--one for audio and one for video. In addition, special video studios are needed, so equipment costs are high.

ADVANTAGES AND DISADVANTAGES OF TELECONFERENCES

The primary advantage of teleconferencing is that it brings together people who may be far apart. As was mentioned earlier, teleconferencing is cost-effective, because it reduces travel time and costs. Another advantage is that the same information is given more quickly to people in different locations than would be possible either face-to-face or with print. Additionally, teleconferencing provides increased access to experts in their fields. Guest lecturers may speak to groups of people from their offices or homes.

The primary disadvantage of teleconferencing is that people can't see each other. An important form of communication is lost when face-to-face contact is not available. When face-to-face contact is not possible or is too expensive, teleconferencing is a popular alternative. The most essential aspect of effective teleconferencing is good quality sound. Teleconferencing, however, relies on a technology in which the quality of both service and equipment are variable. Some teleconferencing equipment does not allow for clear, steady sound. These problems may be particularly true in countries where the telecommunication lines are not fully developed or where costs are high.

CONDUCTING AN AUDIO TELECONFERENCE

Although good audio equipment is necessary for an effective teleconference, the other elements include well-trained personnel, and well-prepared printed materials and other visuals, like slides and video.

The equipment necessary for conducting an audio teleconference includes a telephone at each site in addition to a "hands free" teleconferencing unit, or loudspeaking telephone. The loudspeaking telephone allows all the people in one location to hear voices from the other locations. It also allows people at one place to speak naturally to the people in each of the other places, without having to hold a telephone receiver. For very large rooms, of course, an additional microphone is needed.

The people needed to conduct an instructional teleconference include the following. First, an instructor delivers instruction and acts as the chairperson for the teleconference. Second, a coordinator or assistant at each site makes all local arrangements and communicates with the instructor. Third, a guest lecturer may provide special information from his or her own location. Finally, the students receive the information and communicate with the instructor and with each other.

Instructional materials and methods that are used in teleconferencing are the same as those used in a face-to-face setting. Any printed materials, slides, and audio or video cassettes must be sent to the students before the teleconference. The instructional methods may be the same as in face-to-face settings. Examples of methods include lectures, small group discussions, question and answer sessions, and panel discussions.

It is critical to train personnel to conduct an effective teleconference, especially those who are new to teleconferencing. First, instructors must recognize that they are dealing with a medium in which no visual cues are available. The teleconferencing instructor cannot rely on eye contact as is normal in face-to-face instruction; therefore, a student's questioning look must be replaced by a verbal question. Second, the instructor adopts the role of a "chairperson" who organizes the manner in which the participants speak. In other words, the instructor must make sure that all students have an opportunity to talk and ask questions. Third, a longer planning time is required for teleconferencing. All materials like agendas, worksheets, tapes, and slides must be sent to the students in advance.

THE USE OF TELECONFERENCING IN DISTANCE EDUCATION

Teleconferencing provides a number of examples in distance education today. Since the first reported use of teleconferencing in 1938 by the German Post Office (Olgren & Parker, 1983), this communication technology has been used increasingly for education and training of people at a distance.

In North America audio teleconferencing has been used in higher education since the early 1960s to deliver instruction to students. The University of Wisconsin-Extension has the world's largest and most sophisticated telephone-based delivery system, with over 35,000 students enrolled at 200 sites (Bacsich, Kaye, & Lefrere, 1986). The University of Alaska currently provides teleconference-based instruction to students at over 225 sites throughout that sparsely populated state (Teleconference bridging options..., 1987). A number of Canadian universities use audio conferencing for seminars and tutorials. Teleconferencing is also widely used in public schools. The TI-IN Network in Texas, for example, provides instruction by video conference to school children in rural parts of America where there aren't enough teachers to teach the required classes (Chion-Kenney, 1985).

In addition to its use in education, teleconferencing has been used for training in business and industry. American Telephone and Telegraph trains its own 35,000 employees by teleconference, and Roche Laboratories conduct medical training workshops by teleconference. Roche Laboraties, in fact, has found that their teleconferenced workshops cost about one-quarter of the price of face-to-face seminars (Levinson, 1985).

Instructional teleconferencing in Europe is still quite rare, and it is mostly used in Britain. The British Open University uses both audio and audiographic conferences, called Cyclops, for seminars and tutorials. Each Open University region is responsible for its own teleconferencing, and its use varies greatly from region to region. In addition to the Open University, other universities and institutions of higher education in Britain use teleconferencing for instruction. They include the Welsh National School of Medicine, University College Dublin, and Ulster Polytechnic.

In other parts of the world, teleconferencing is used more widely because of the great geographical distances separating instructor and learners. In Australia, for example, teleconferencing connects instructors and students at the Brisbane College of Advanced Education. At the Australian Society of Educational Technology, most meetings are held by teleconference. In Indonesia, both audio and audiographic conferencing assist exchange of course material from island to island. And at the Science University of Malaysia, audio conferences support the instruction to off-campus students.

THE FUTURE OF TELECONFERENCING

Satellites are now a well-established part of telecommunications. The satellite age began with the launching of the Russian satellite Sputnik in 1957. Satellites can carry audio, text and graphics, and video over long distances like oceans, or over large and difficult areas like India and Australia. In the province of British Columbia, Canada, for example, satellites are used to provide video instruction and telephone tutoring to small and isolated communities. On a larger scale, the National University Teleconference Network (NUTN) is a network of over 100 North American universities that use satellites to provide teleconferences of every variety.

Integrated Services Digital Network, or ISDN, is a newly developing communication system based on the telephone, a computer and modem, and television. It allows interactive communication of voice, text and data, and video, all on the same network. Through ISDN, the instructor and students may talk with each other while seeing each other on a television screen, and they may send text and graphics to each other at the same time. San Diego State University conducted a pilot study about the use of ISDN from personal workstations. The results of the study show that ISDN is useful for both developing and delivering instruction, and that those who used it found it acceptable for instruction (Saba & Vitaglione, 1988). If the costs can be kept low and personal workstations can be used, ISDN provides an exciting challenge to distance educators (Bacsich, Kaye & Lefrere, 1986).

TELECONFERENCING IN TURKEY

Video conferencing was first put into effect in October, 1986, during the exhibition of the 145th anniversary of PTT. The first commercial application of teleconferencing was during Summer, 1987, when Prime Minister Turgut Özal gave a press conference by satellite video from Houston, Texas. Twelve similar video conferences have been held in Turkey since then. A recent video conference was broadcast on German television.

The Turkish PTT presently can connect as many as six locations with a conference bridge. They report that Conference Call, which is one of the subscriber features in digital exchanges, will be available in the near future. This means that people who want to participate in an audio teleconference may dial a telephone number from their own telephone set and be connected with several other sites.

The potential use of teleconferencing in Turkey is great. Instructional teleconferencing can be used in existing distance education programs for seminars and tutorials. These existing programs are the Open Education Faculty of Anadolu University, correspondence education through the FONO Correspondence School, and the widespread apprenticeship and nonformal education program of the Ministry of Education. Another potential application is for universities to share teaching resources and have group seminars throughout the university system. This allows professors to teach students in other universities or academies of higher education without leaving their own university. The potential for teleconferencing is great also for Turkish business and industry. Meetings can be held by telephone instead of requiring executives and employees to travel several hours in order to hold a face-to-face meeting.

LIVE EXAMPLE OF AN AUDIO TELECONFERENCE

In a few minutes you will participate in Turkey's first multi-point audio teleconference. Four locations will be connected by the PTT conference bridge in Ankara, the capital. The locations are American Telephone and Telegraph (AT&T) in Cincinnati, Ohio, this conference room here in Istanbul, Anadolu University in Eskişehir, and the Ministry of Education in Ankara.

I will be your instructor for the teleconference, and I have invited Dr. Alan Chute, Director of the National Teletraining Network of AT&T, to be our guest lecturer today. Alan will talk about the way that AT&T uses teleconferencing for training their employees and clients throughout America. At the end of Alan's talk, people at each location will be able to ask questions of either Alan or me.

Coordinators at each location have already been trained to assist today's teleconference. AT&T sent slides and printed materials in advance to each coordinator. These slides will accompany Alan's talk at each location, and every participant should already have a copy of the abstract.

Now, let's take a break for a few minutes and be ready to start the audio teleconference promptly at 4.30.

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AUDIO TELECONFERENCE